REVIEW

Identification and Treatment of Eating Disorders in the Primary Care Setting

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Eating disorders, which are associated with a host of adverse medical morbidities, negative psychological sequelae, and considerable reductions in quality of life, should be diagnosed and treated promptly. However, primary care physicians may find it uniquely challenging to detect eating disorders in their early stages, before obvious physical problems arise and while psychological symptoms are subtle. Although psychological symptoms may dominate the presentation, the physician is an integral member of the treatment team and is in a unique role to diagnose and treat eating disorders. This clinical review surveys the eating disorders literature, identified by searching MEDLINE and PubMed for articles published from January 1, 1983, to September 30, 2009, using the following keywords: *anorexia nervosa*, *bulimia nervosa*, *eating disorders*, *eating disorders NOS*, *binge eating*, *binge eating disorder*, and *night eating syndrome*. This review also focuses on practical issues faced by primary care physicians in the management of these conditions and other issues central to the care of these complex patients with medical and psychiatric comorbid conditions.

***Mayo Clin Proc.* 2010;85(8):746-751**

AN = anorexia nervosa; BED = binge-eating disorder; BN = bulimia nervosa; CBT = cognitive behavior therapy; *DSM* = *Diagnostic and Statistical Manual of Mental Disorders*; EDNOS = eating disorder not otherwise specified; NES = night-eating syndrome

Health service utilization among adults with eating disorders is high, and hospitalization expenses are on the rise.[1] Among adults with eating disorders, at least half had their disorder first diagnosed by their primary care physicians.[2,3] Although primary care physicians are in a unique role to diagnose and treat eating disorders, reviews of medical education frequently show a lack of adequate training in their identification and treatment, and hence health care professionals may only detect an eating disorder once substantial medical and psychological consequences have developed.[3,4] This review discusses the main eating disorders seen in primary care, including anorexia nervosa (AN), bulimia nervosa (BN), binge-eating disorder (BED), night-eating syndrome (NES), and eating disorder not otherwise specified (EDNOS), detailing the signs and symptoms of each of these eating disorders, screening tests to detect them, and pharmacological and psychosocial approaches to their treatment (Table 1).To identify eligible studies, we searched MEDLINE and PubMed for articles published from January 1, 1983, to September 30, 2009, using the following keywords: *anorexia nervosa*, *bulimia nervosa*, *eating disorders*, *eating disorders NOS*, *binge eating*, *binge eating disorder*, and *night eating syndrome.* We also reviewed the reference section of each of the eligible primary studies and of narrative and systematic reviews to identify additional candidate studies.

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ANOREXIA NERVOSA

The prevalence of AN is approximately 0.5% to 1% and is highest among adolescent girls and young women. Anorexia nervosa is characterized by an abnormally low body weight (at least 15% below what would be expected), a corresponding fear of weight gain, and an undue emphasis on weight and shape in self-evaluation.[5] Although amenorrhea (ie, loss of 3 consecutive menstrual cycles) is currently required for the diagnosis, the importance of this symptom is unclear, and as such, the eating disorders workgroup of the *Diagnostic and Statistical Manual of Mental Disorders (DSM)* (Fifth Edition) has strongly considered removing it as a criterion for AN.[6] Anorexia nervosa can be classified into 2 subtypes: the restricting subtype and the binge-eating/purging subtype. Patients with AN who rarely binge-eat or purge but maintain a fairly regular pattern of caloric restriction may be classified as having the restricting subtype, whereas those who regularly engage in binge eating and/or compensatory behavior to prevent weight gain will be diagnosed as having the binge-eating/purging subtype.[5] Many of those with the restricting subtype will eventually develop binge eating, with at least one-third of patients crossing over into BN.[11] Crossover to binge eating and BN typically occurs within the first 5 years of the illness.[11] Women with AN who develop BN are likely to relapse back into AN.[11]

The outcomes associated with AN are poor, with only a 35% to 85% recovery rate and a protracted recovery, ranging from 57 to 79 months.[12] Not only can AN evolve into a chronic condition, it is one of the most medically serious psychiatric disorders.[13,14] People with AN are affected by the physical consequences of the severe weight loss, along

TABLE 1. **Guide to Identification and Treatment of Patients With Eating Disorders in the Primary Care Setting**

Eating disorder	Demographic characteristics and diagnostic symptoms	Screening tool options	Common physical symptoms to monitor	Pharmacological treatment	Psychological treatment
Anorexia nervosa (AN)	Female 13-25 y BMI <18.5 Amenorrhea Restrictive eating Fear of weight gain (not always disclosed)	SCOFF[7] EDDS[8]	Hypokalemia Hypophosphatemia Hypomagnesemia Renal function ECG (bradycardia and arrhythmias) Metabolic alkalosis Osteopenia	No evidence for fluoxetine or other SSRI for AN symptoms SSRIs beneficial for treatment of comorbid anxiety and depression	Maudsley family-based therapy for adolescents CBT or other comparable modality (no differences between modalities)
Bulimia nervosa (BN)	Female 16-35 y 18.5 > BMI < 25 Binge eating Vomiting, fasting, or other compensatory behavior Strong drive for thinness	SCOFF[7] EDDS[8]	Hypokalemia Hypomagnesemia Renal function Metabolic alkalosis Russell signs Dental caries Enamel erosion	Fluoxetine or other SSRI for BN symptoms SSRI for comorbid symptoms	CBT has most evidence for BN and comorbid symptoms Interpersonal therapy Dialectical behavior therapy
Binge-eating disorder	Male and female 25-50 y BMI >25 Binge-eating with absence of compensatory behavior	EDDS[8] EAT[9] QEWP-R[10]	Complications related to obesity Limited ability to lose weight	Sibutramine for weight loss Orlistat for weight loss SSRI for comorbid depression or anxiety	Group or individual CBT for binge-eating and comorbid symptoms Behavioral weight management
Night-eating syndrome	Male and female BMI >25 25%-50% of kilocalories consumed after evening meal Initial insomnia	Not available	Complications related to obesity Limited ability to lose weight	Sertraline or other SSRI	Research evidence not available Behavioral therapy for weight management or eating modification

BMI = body mass index; CBT = cognitive behavioral therapy; EAT = Eating Attitudes Test; ECG = electrocardiograpy; EDDS = Eating Disorder Diagnostic Scale; QEWP-R = Questionnaire on Eating and Weight Patterns-Revised; SSRI = selective serotonin reuptake inhibitor.

with psychological comorbid conditions that contribute to mortality,[15] with suicides representing a large portion of the deaths from AN.[14] Depression, a consequence of poor caloric intake and low weight, is frequently comorbid with AN and often resolves with refeeding.[16] Anxiety symptoms are common and often precede the development of the illness.[17]

The emaciated patient requires urgent medical attention, with close monitoring for dehydration, electrolyte disturbances, renal problems, cardiac compromise with a variety of arrhythmias, and refeeding syndrome. Hypomagnesemia may underlie hypokalemia that persists despite replacement. Metabolic alkalosis is the most common acid-base disturbance in patients with eating disorders, particularly those who purge by vomiting. Rapid development of hypophosphatemia during refeeding may herald refeeding syndrome, characterized by rapid shifts in fluids and electrolytes, including hypomagnesemia, hypokalemia, gastric dilation, and severe edema. Although relatively rare, this syndrome may even result in delirium, cardiac arrhythmia, coma, and death.[18] Gradual initial refeeding of the severely underweight patient can help prevent refeeding syndrome. Phosphorus supplementation should be initiated early, and phosphorus levels should be sustained above 3.0 mg/dL (to convert to mmol/L, multiply by 0.323). Patients should be monitored daily for hypophosphatemia, hypomagnesemia, hypokalemia, and other electrolyte disturbances, with treatment as needed. Accordingly, inpatient treatment may be indicated in patients who are less than 70% of ideal body weight or when low weight is accompanied by bradycardia, hypotension, hypoglycemia, hypokalemia, or hypophosphatemia.

The negative effect of AN on patients' long-term physical health is well established. Given that AN most commonly affects women during the period of development of peak bone mass, the effects on bone can be severe and debilitating.[13,19] Although estrogen preparations, mostly oral contraceptives, are widely prescribed to women with AN for the purpose of ameliorating bone loss, little evidence supports its use.[20-22] Not only do estrogen preparations provide questionable benefit, they also present some disadvantages to women with AN.[21] Once oral contraceptives reestablish menses, the clinician's ability to discern when a healthy weight has been reached, signaled by resumption of menses, becomes disrupted, and an important source of motivation for weight restoration is lost to the patient.[21]

Although the format has not been systematically investigated, practice guidelines for the treatment of AN recommend a multidisciplinary approach involving medical management, nutritional intervention, and psychotherapy.[23] The

research literature is limited by small trials and lack of randomized trials. A recent meta-analysis of psychotherapies found that no specific psychotherapy was consistently superior to any other approach. However, for children and adolescents, a family-based approach for the treatment of eating disorders has demonstrated positive outcomes for adolescents with early onset and relatively short histories of AN.[24-27] This approach entails a specific form of family therapy in which the family is enlisted as a resource in the treatment of the patient.[27]

Although selective serotonin reuptake inhibitors are frequently prescribed for AN, most placebo-controlled trials have not found evidence that these medications improve weight gain, eating disorders, or associated psychopathology. Moreover, a recent study found no differences in the time to relapse between weight-restored patients with AN who were randomized to fluoxetine and those receiving placebo.[28]

BULIMIA NERVOSA

The clinician will encounter patients with BN more often than those with AN, because BN has a higher prevalence among women (1.0%-1.5%). However, often secretive and lacking obvious physical stigmata such as emaciation, patients with BN may avoid detection, with only a minority seeking treatment.[2,29] The modal patient is a woman aged 16 to 22 years; however, the physician may encounter BN in older patients. Bulimia nervosa can be classified into 2 subtypes: the purging type, which is characterized by episodes of binge-eating (an inordinately large amount of food, in a short period of time, in an out-of-control fashion), followed by compensatory behavior, such as self-induced vomiting, laxative abuse, and diuretic abuse; and the nonpurging type, which is characterized by excessive exercise, fasting, or strict diets.[5] As with AN, patients with BN may place undue emphasis on their body shape and live in fear of gaining weight.[5] Currently, if binge eating and purging occur in the context of low weight and amenorrhea, AN is diagnosed. Although crossover from AN to BN is common, crossover from BN to AN is relatively rare unless the patient was originally diagnosed as having AN.[11]

In terms of screening measures for the primary care physician, the SCOFF is a brief instrument (5 questions, <2 minutes to complete) that assesses the core psychopathology of AN and BN in early stages of the disorders.[7,30] The SCOFF has been found to have high sensitivity and specificity for AN and BN.[30,31] It includes the following questions: (1) Do you make yourself *S*ick because you feel uncomfortably full? (2) Do you worry you have lost *C*ontrol over how much you eat? (3) Do you believe yourself to be fat when *O*thers say you are too thin? (4) Have you recently lost more then *F*ourteen pounds in a 3-month period? and (5) Would you say that *F*ood dominates your life? Although it has been suggested that 2 or more affirmative answers warrant further investigation for an eating disorder, it is wise to gather more information about eating disorder symptoms if any of these items are endorsed, particularly because substantial weight loss or self-induced vomiting alone should be sufficient to prompt further inquiry.[30,32] All clinicians should be appropriately suspicious of substantial weight loss, particularly in a patient of previously normal weight.

Findings on physical examination may not establish the presence of BN. Most patients with BN will be of normal weight. Russell sign, calluses, or abrasions on the dorsum of the hand overlying the metacarpophalangeal and interphalangeal joints, caused by repeated contact with the incisors during self-induced vomiting, can tip off the observant clinician. Unexpected frequency of dental caries and enamel erosion from repeated vomiting are other physical signs. Laboratory findings of hypokalemia, metabolic alkalosis, and/or hypochloremia in an otherwise healthy, young woman should also prompt inquiry. As is the case for the patient with the AN binge/purge subtype, hypomagnesemia may underlie hypokalemia that persists despite replacement. Electrolyte disturbance of these types and intestinal dysfunction (eg, bloating, sluggish bowel function) are common medical complications of BN.

The most effective treatments emerging for patients with BN include a specific type of psychotherapy, *cognitive behavioral therapy* (CBT), that focuses on modifying the specific behaviors and ways of thinking that maintain the binge-eating and purging behaviors. Fluoxetine, an antidepressant of the selective serotonin reuptake inhibitor category, is the only agent approved by the Food and Drug Administration for the treatment of BN. Most other classes of antidepressant medications have shown some benefit, regardless of whether the patient is depressed; however, it should be noted that bupropion is contraindicated because of increased seizure risk in eating disorders. Overall, medication plays a legitimate role in reducing the symptoms of BN and associated comorbid conditions; however, it is viewed as an adjunctive treatment to psychotherapy.[33]

BINGE-EATING DISORDER

Binge-eating disorder is characterized by the consumption of large amounts of food in a 2-hour time period, accompanied by a perceived loss of control.[5] Additional symptoms include feeling uncomfortably full, eating rapidly, eating alone, eating when not hungry, and feeling disgusted afterward.[34] Unlike BN, compensatory behavior (eg, vomiting,

laxative abuse) does not accompany these binge episodes.[5] When diagnosing BED, the clinician should take care to differentiate it from overeating. Overeating episodes often occur at social functions, where abundant food is readily available, the mood is relaxed or positive, and other people are also overeating, whereas binge episodes typically are secretive and occur in the context of negative mood and all-or-nothing thinking. Primary care physicians may elect to screen for BED using the Eating Attitudes Test, the most widely used eating disorder screening tool.[9] Alternatively, the Eating Disorder Diagnostic Scale is a 22-item, self-report inventory created to diagnose AN, BN, and BED in accordance with *DSM-IV* criteria.[8] However, the Questionnaire on Eating and Weight Patterns-Revised, which generates diagnostic information regarding BED, in addition to information regarding dieting and weight history, has been widely used with diverse community and clinical samples, including severely obese candidates for bariatric surgery.[10,35,36]

The prevalence of BED in community samples is 2% to 3% of the general population[2] but is much higher in weight management settings (30%) and among those who are severely obese (50%).[37] Binge-eating disorder occurs in both men and women and affects many diverse populations and a broad age range (those aged 25-50 years).[2] Physical complications associated with BED are usually secondary to attendant obesity.[38] Although some studies suggest that BED may be a prognostic indicator of those who will have a poor outcome on a weight loss program, the findings on this topic are mixed. Because many patients with BED are overweight or obese, some concern exists about whether to first refer patients to a behavioral weight loss program or to a BED treatment program. This is a hotly debated issue, with some empirical evidence suggesting that BED treatment prebehavioral weight loss is associated with greater long-term weight loss success.[39]

The empirically supported psychotherapy treatment with the best outcome results for binge eating is CBT.[39-44] A number of pharmacological agents have been used alone to treat BED, with limited success. Sibutramine has been shown by several randomized controlled trials to reduce binge eating and weight.[45] Sibutramine is not used in patients with cardiovascular disease. One randomized controlled trial reported higher BED remission rates for those treated with a combination of topiramate and CBT than for those who received placebo. Another randomized controlled trial supported the combination of medications and CBT, with the combination of CBT and orlistat improving weight loss outcomes in obese binge eaters.[46] As such, a comprehensive approach that may combine psychotropic medications, psychotherapy, and nutritional guidance is suggested.

NIGHT-EATING SYNDROME

Night-eating syndrome was initially described by Stunkard et al[47] as early as the 1950s as a syndrome consisting of morning anorexia, evening hyperphagia, and insomnia. Prevalence rates increase with increasing adiposity and have been estimated at 1.5% to 5.2% in the general population, 6% to 14% in obese outpatients, and 8% to 42% in patients seeking bariatric surgery.[48,49]

Typically viewed as a long-term circadian shift in eating behaviors, NES may be exacerbated by stress.[50] It should be distinguished from "nocturnal sleep-related eating disorder," a parasomnia that occurs much less frequently in this population, is characterized by eating unusual foods or nonfood substances associated with a semiconscious state or sleep walking, and can be associated with the use of hypnotic agents.[51] A recent evaluation of the diagnostic criteria for NES identified 3 core features of the disorder: (1) evening hyperphagia and/or nocturnal eating, (2) initial insomnia, and (3) awakenings from sleep. The first 2 criteria must both be present to indicate a diagnosis of NES.[49]

Behavioral and psychological correlates of NES have been identified in the literature. Night eaters typically engage in more frequent eating episodes (9.3 vs 4.2 in 24 hours), consume a larger percentage of their daily calories between 8 PM and 6 AM (>50% vs 36%), and experience more frequent nighttime awakenings.[51] However, their overall caloric intake does not differ from that of controls. They tend toward carbohydrate-rich nighttime snacks with a high carbohydrate-to-protein ratio (7:1).[51] Night-eating syndrome has also been associated with low mood (especially after 4 PM), depression, life stress, and low self-esteem, although perhaps to a lesser degree than BED.[48,49,51,52] Up to 40% of night eaters may engage in binge-eating episodes, especially in obesity treatment–seeking populations, although comorbidity for both clinical disorders is relatively low in the general population.[48]

The primary physical complications related to NES are obesity or limited ability to lose weight. Empirically supported treatments for NES are currently lacking. Sertraline has demonstrated beneficial effects for nocturnal eating episodes, weight loss, and mood in an open label trial, a randomized clinical trial, and in small studies examining consultation with primary care physicians at a distance.[53-55]

Primary care physicians should query nighttime eating behaviors in patients struggling with obesity or limited weight loss despite their best efforts. Assessment should focus on evening hyperphagia and/or nocturnal ingestions (occurring after the evening meal), initial insomnia, and awakenings from sleep. Combined with initial insomnia, ingestion of 25% to 50% of daily caloric intake after the evening meal would most likely signify an NES.[49] If pres-

TABLE 2. **Clinical Suggestions for the Primary Care Physician**

Primary care strategies	Clinical summary of key areas in eating disorders
Diagnosis/ assessment	Patients with eating disorders who binge-eat and purge but have low weight (body mass index <18.5) and amenorrhea would meet criteria for AN binge/purge type
	The SCOFF is a short screening measure that has good specificity and sensitivity for AN and BN
	In assessing binge-eating episodes, it is important to distinguish overeating from binge eating
	BED and NES should be assessed in patients presenting for weight management treatment and in those who are severely obese
	Evening hyperphagia and nocturnal eating must be present to warrant a diagnosis of NES
Management of physical symptoms	Little evidence supports the use of oral contraceptives in preventing bone loss in the amenorrheic patient with an eating disorder
	Hypokalemia and intestinal dysfunction are the 2 most common medical complications of BN
	The physical complications of BED are often secondary to unhealthy weight loss behaviors or obesity
Treatment referral suggestions	Adolescents with AN should be referred for Maudsley family-based therapy
	SSRIs have little benefit in treating eating disorder symptoms or preventing relapse in AN patients
	The criterion standard treatment for BN involves a combination of CBT and psychotropic medication (eg, fluoxetine)
	Patients with BED benefit from a comprehensive approach that involves CBT, psychotropic medications, and nutritional guidance
	Sertraline has demonstrated beneficial effects for NES

AN = anorexia nervosa; BED = binge-eating disorder; BN = bulimia nervosa; CBT = cognitive behavioral therapy; NES = night-eating syndrome; SSRI = selective serotonin reuptake inhibitor.

ent, health care professionals may encourage regular meal consumption earlier in the daytime, emphasizing a shift in timing of caloric intake overall and increased protein intake for the patient. Referral to a dietitian may assist with this and other nutritional interventions. Mood and stress should be assessed further in these patients, given the potential associations with eating difficulties. For these patients and those with persistent nighttime eating behaviors, referral to a behavioral psychologist may be appropriate. Many patients may benefit from psychoeducation materials.[56]

EATING DISORDER NOT OTHERWISE SPECIFIED

Most patients presenting to clinical settings would be classified as having an eating disorder not otherwise specified (EDNOS), a category designated in the *DSM* (Fourth Edition, Text Revision), for eating disorders of clinical severity that fall outside the specified diagnostic criteria of AN or BN.[57] Because it is currently classified a "category for further study," EDNOS would also be used to formally diagnose BED. In addition, EDNOS would be the formal diagnostic label to identify NES in patients for whom the behavior is particularly problematic, applying the best available criteria for NES given the historical lack of consistent guidelines. Other examples of EDNOS include female patients who meet all criteria for AN but who continue to menstruate, patients who meet all criteria for BN with less than twice weekly frequency of binge eating, or people of normal weight who use compensatory behaviors after ingesting small amounts of food.[5] Failure to meet the criteria for AN or BN does not rule out the existence of an eating disorder. In fact, those with EDNOS have been found to have a high level of general psychiatric symptoms and a degree of illness severity and core psychopathology that is comparable to that of those with AN and BN.[57] Table 2 reviews the diagnostic, medical management, and treatment suggestions for the various eating disorders.

CONCLUSION

Eating disorders are severe psychological illnesses associated with a host of adverse medical morbidities, negative psychological sequelae, and substantial reductions in quality of life. Given these consequences and the fact that health service utilization among people with eating disorders is relatively high, it is particularly important for physicians to adequately assess for these disorders. Although the eating disorders presented in this review vary widely in their demographic, weight, and symptom presentations, most benefit from a coordinated multidisciplinary effort, often involving specialized psychological treatment, medication management, and medical monitoring. It is also important to note that people with eating disorders ranging from AN to NES share an embarrassment about their inability to control their eating and weight and/or fear of judgment by the health care professional. The unflappable, nonjudgmental health care professional, armed with a plan for recovery, can make a real difference to such patients.

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